

# PATENT SPECIFICATION

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## (54) HOSPITAL BED ATTACHMENTS

(71) We, SIDDALL & HILTON LIMITED, of Claremount Road, Boothtown, Halifax, in the county of York, a British Company do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention is concerned with hospital beds, that is to say beds which are designed primarily for use in hospitals, clinics, nursing homes and like institutions, where the occupant of the bed may be in need of medical attention. It is usual for the head and foot of a hospital bed to be detachable, and other optional attachments may be provided such as side frames and support structures providing gantries over the bed.

The invention provides a hospital bed having an attachment therefor, the bed or attachment having a tongue rigidly secured thereto, the tongue having a wedge portion for engagement between a pair of abutments on the attachment or bed, the included angle between the faces of the wedge portion lying within the range 12° to 20°. A particularly suitable angle is 16°.

According to a preferred feature of the invention, a socket is provided on the attachment or bed to receive the tongue, the socket having a vertical inside face and a convex curved face facing the vertical face, these two faces providing the pair of abutments for engagement with the wedge portion of the tongue. It is also preferred that the wedge portion has a vertical face for engagement with the vertical inside face of the socket, and a face inclined to the vertical for engagement with the curved face in the socket. The curved face may conveniently be provided by a cylindrical rod within the socket.

Preferably there are two or more of the tongues secured to the bed or attachment at spaced apart positions, and a corresponding arrangement of pairs of abutments on the attachment or bed.

By way of example, a specific embodiment of the invention will now be described, with reference to the accompanying drawings, in which:—

Figure 1 is an end view of part of a bed according to the invention; and

Figure 2 is a longitudinal section through the foot portion of the bed.

The bed generally comprises a mattress frame having longitudinally extending side members 10 and shorter box section end members 11. Only one side member and one end member are visible in the drawings. The frame carries the legs of the bed (not shown) and there may be a jacking mechanism between the frame and legs as on many conventional hospital beds.

Two sockets 12 are welded to the outer end face of the foot end member 11 at widely spaced positions, so that each socket is near to the corresponding end of the foot end member. Each socket consists of a piece of hollow metal tube, of rectangular section, mounted on the foot end member 11, so that the open ends of the socket are at the top and bottom. Hence, the inside face 14 of the wall of the socket which is welded to the end face of the member 11 forms a vertical inside wall, which acts as a location abutment, as will hereinafter appear. Also, a cylindrical rod 13 about half an inch in diameter is welded in each socket, so that it extends transversely of the socket, parallel to the member 11, at a position spaced from the aforesaid vertical inside face, thereby presenting a convex curved wall, facing towards the vertical location face 14.

The bed foot 15 has two metal tongues 16 secured to the lower part of the bed foot, by screws 17. The tongues are spaced apart transversely of the bed foot, so that each tongue is in position to co-operate with one of the sockets 12 provided on the bed frame. Each tongue consists of a vertically disposed strip of metal, of generally rectangular cross-section, part of the strip projecting below the bottom edge of the foot. This lower projecting portion 18 of the strip is shaped to provide a snout portion, which is

narrower than the upper portion of the tongue, but has parallel faces, the snout portion being joined to the upper wider portion of the tongue by a wedge-shaped portion 19. The portion 19 has an inclined face on the side nearest to the foot, which face faces the rod of the socket, when the tongue is lowered into the socket.

The face of the tongue furthest from the foot is straight throughout its length, and when the tongue is lowered into the corresponding socket, this face of the tongue engages with the vertical location face 14 inside the socket. The width of the snout is less than the minimum distance between the vertical location face of the socket and the curved periphery of the rod, so that the snout passes easily between the rod and the location face. However, the upper portion of the tongue is wider than the space between the location face and the rod, and consequently as the tongue is lowered, the inclined surface of the tongue engages with the curved periphery of the rod.

It is an important feature of this example, that the angle of inclination of the inclined face to the vertical, shall be within predetermined limits of  $12^\circ$  to  $20^\circ$ . Hence, as the tongue enters the socket, there is a proper location of the tongue (and hence the bed foot) relatively to the socket, but on the one hand, the angle of the inclined portion is not so great that it merely rests on the rod and does not serve to hold the bed foot rigid, whereas on the other hand, the angle of inclination is not so low that there is a real wedging action between the tongue and the socket. It will be appreciated, that it is highly undesirable to have a bed foot which is not held rigidly in position, but at the same time it is convenient for a nurse to be able to remove the bed foot by simply lifting it to release the tongues from their respective sockets, without having to overcome a severe wedging action.

It will be appreciated that instead of providing a vertical location face and a curved wall within the socket, a similar effect could be obtained by a pair of spaced rods, but in that case it would be difficult to obtain a good location of the tongue because there would be only line contact between the tongue and the rods on both sides, whereas in the construction described above, there is line contact between the tongue and the rod, but full area contact between the vertical face of the tongue, and the vertical location wall in the socket.

It has been found that a very effective

angle of inclination to the vertical for the inclined portion of the tongue is  $16^\circ$ .

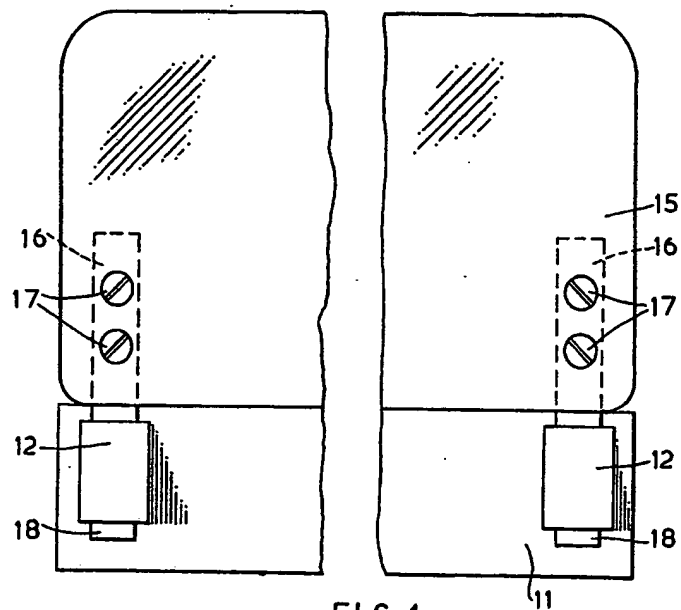
Whilst in the above specific example, the invention has been described with reference to a bed foot, the invention can also be applied to the head, side frame or other attachments which have to be removable from the bed itself. Furthermore it is possible for the tongues 16 to be attached to the bed, the sockets 12 being provided on the foot, head or other attachment.

#### WHAT WE CLAIM IS:—

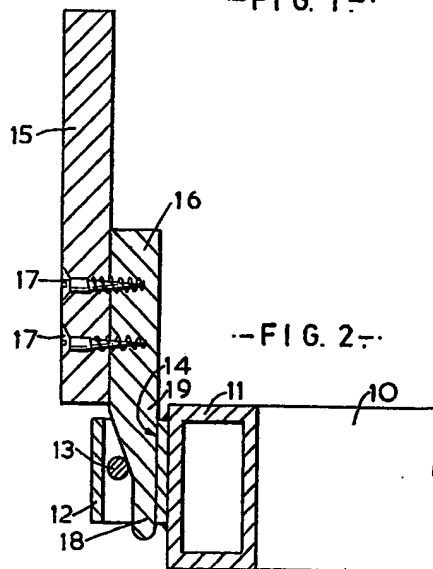
1. A hospital bed having an attachment therefor, the bed or attachment having a tongue rigidly secured thereto, the tongue having a wedge portion for engagement between a pair of abutments on the attachment or bed, the included angle between the faces of the wedge portion lying within the range  $12^\circ$  to  $20^\circ$ .
2. A hospital bed as claimed in Claim 1, in which the said included angle is  $16^\circ$ .
3. A hospital bed as claimed in Claim 1 or Claim 2, in which a socket is provided on the attachment or bed to receive the tongue, the socket having a vertical inside face and a convex curved face facing the vertical face, these two faces providing the pair of abutments for engagement with the wedge portion of the tongue.
4. A hospital bed as claimed in Claim 3, in which the wedge portion has a vertical face for engagement with the vertical inside face of the socket, and a face inclined to the vertical for engagement with the curved face in the socket.
5. A hospital bed as claimed in Claims 3 or 4 in which the curved face is provided by a cylindrical rod within the socket.
6. A hospital bed as claimed in any one of the preceding claims, in which there are two or more tongues secured to the bed or attachment at spaced apart positions, and a corresponding arrangement of pairs of abutments on the attachment or bed.
7. A hospital bed as claimed in Claim 6, in which the attachment comprises a foot-board for the bed and there are two tongues arranged one adjacent each end of the foot-board, and two corresponding pairs of abutments arranged on the frame of the bed.
8. A hospital bed constructed and arranged substantially as hereinbefore described, with reference to and as illustrated in the accompanying drawings.

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-FIG. 1-



-FIG. 2-